

Proper concentration of hydrogen peroxide proved to be a good forcing agent for such of these seeds as would not germinate readily, due to age or other causes. A 50 per cent aqueous solution of 8 vol. H_2O_2 completely inhibited germination, but 25 per cent and weaker solutions did not, but acted as forcing agents. While hydrogen peroxide hastened germination, it retarded the growth of the seedling.—WM. CROCKER.

Age and area hypothesis.—WILLIS²⁵ has recently advanced additional evidence to support his "age and area" hypothesis. Following his usual statistical method, he shows that the most widespread plants in New Zealand are those which reach outlying islands of the archipelago also. "There is no conceivable reason why ranging also to a few little islands should make a species more widespread in New Zealand, unless it be age, which has given them time to spread in New Zealand to the maximum degree."

In an accompanying paper the same author²⁶ strengthens his hypothesis by four additional pieces of evidence, arising from statistics on the following situations: the range of the orchids of Jamaica; the flora of Hawaii; the distribution of *Callitris* (Coniferae); the distribution of the ferns of New Zealand and Hawaii. "The endemic species (of ferns) show a much greater range than the endemic angiosperms, a result to be expected on my hypothesis, but contrary to what one would expect if endemics are dying out." In conclusion, the author points out that more care must be taken to consider geographical as well as structural relationship in forming genera and families.

It occurs to the reviewer to suggest that, in collecting data to support or discredit the age and area hypothesis, care should be taken that the plants considered are ecologically equivalent. The age and area hypothesis is founded on rate of distribution, and the latter certainly must vary as plants vary in their ecological status. In some of his more recent researches WILLIS has limited his consideration to plants of a given family. This should be more accurate than to consider any flora as a whole, for the plants within a given family are usually equivalent in their ecological status. This last, however, is not always true, so that the significance of some of the data given by WILLIS on distribution might sometimes be questioned. For example, it may be quite proper to say that widespread fern species are older than fern species of narrower distribution, but to state that because ferns are more widespread than angiosperms, the former are therefore older, is very questionable. Even if ferns were younger than angiosperms, the ease of spore dispersal might well render them more widespread than the latter.—MERLE C. COULTER.

²⁵ WILLIS, J. C., The distribution of the plants of the outlying islands of New Zealand. *Ann. Botany* 31:327-333. *fig. 1*. 1917.

²⁶ ———, Further evidence for age and area; its applicability to the ferns, etc. *Ann. Botany* 31:335-349. 1917.